Electronic Health Record (EHR) Solutions LTPAC Providers Need Today

Version 1.0

A Whitepaper by the CIO Consortium & Nurse Executive Council | June 12, 2013

You are encouraged to freely distribute this whitepaper as a complete PDF document.

This version 1.0 whitepaper is a statement of professional opinion by senior information technology professionals and senior nurse executives employed by Long Term and Post Acute Care (LTPAC) providers. Altogether, more than 40 professional contributed to the generation of this document.

The CIO Consortium (CIOC) and Nurse Executive Council (NEC) view the vision contained in this whitepaper as a key milestone on the journey to truly useful Health Information Technology (HIT) across LTPAC settings, creating a point of reference additional stakeholders will incorporate in their language and plans. As these other stakeholders send their comments back, we envision developing future versions of the whitepaper which incorporate such feedback in new sections.

For all inquiries pertaining to this whitepaper, to make contact with members of the CIOC / NEC, or to submit formal feedback, please send via email to ehrcomment@directsupply.com or call 866-686-5875 and someone will assist you.

© 2013 Direct Supply, Inc. and the respective companies and/or individuals comprising the CIO Consortium (CIOC) and Nurse Executive Council (NEC).

Background and Collaboration between the NEC and CIOC

With the passing of the HITECH provisions of the Stimulus Act of 2009 and final passage into law of the Patient Protection and Affordable Care Act (Obamacare) nearly two years later, the need for health information technology jumped to the front stage of American politics. The laws called for incentives for physicians and hospitals to install Electronic Health Record (EHR) systems. The concept of "Meaningful Use" would emerge in stages defining expectations for interoperability across many different healthcare providers.

Unfortunately, health care providers operating across various Long Term and Post Acute Care settings were not included in these incentives. Members of the CIO Consortium, fresh from developing an EMR Cost Study in 2011[1], felt more needed to be done to help align all the stakeholders involved in LTPAC settings to be able to achieve true, effective EHR.

The CIOs realized they could not do this alone. Later in 2011, they reached out to the Nurse Executive Council for help in crafting a visionary whitepaper – a position statement about the needs for EHR across Post-acute settings. Work to organize our task began that summer yet was slowed by Medicare funding cuts announced in August 2011. Work began in earnest early 2012. Over nearly 14 months, about 40 senior technologists, senior nurse executives, and supporting staff members collaborated to generate this paper.

The paper you hold in your hands is the final result. It is not meant to be an RFP or a comprehensive statement of features and functions. It is meant to help describe what a state of success looks like across post-acute care settings.

The Nurse Executive Council

The Nurse Executive Council provides a forum and serves as the voice of nurse leadership in the post-acute and long term care environment. Our voice provides healthcare organizations and stakeholders with experiential knowledge that will continue to enhance quality of care through leadership and encourage innovation for ongoing improvements in care delivery and patient safety. More details about the NEC, how to contact them directly, and a listing of member organizations can be found at http://nurseexecutivecouncil.com .

The CIOC Consortium

The CIO Consortium provides a forum to advance the state of technology and technology leadership across long term and post-acute care. Members meet several times each year, either in-person or virtually; engaged in dialog using a list sever, and work together on joint projects such as the EMR Cost Study and this EHR whitepaper. In early 2013, a Security Subcommittee formed to explore existing and emerging security challenges faced by member companies in our increasingly digitally connected world. All CIOC activities are planned and approved by the CIOC Advisory Board. To reach the CIOC, please contact Jennie Piotrowski at jpiotrowski@directs.com or 414.760.5875. CIOC members work at 46 companies with more than 6,000 locations serving more than 585,000 residents and patients across various post acute care settings.

---

[1] The EMR Cost Study is available at AHCA's public website under the link "Electronic Medical Records (EMR) Cost Study" on this page: http://www.ahcancal.org/facility_operations/hit/Pages/default.aspx

Contents

Electronic Health Record (EHR) Solutions LTPAC Providers Need Today Version 1.0 1

Background and Collaboration between the NEC and CIOC 2

The Nurse Executive Council 2

The CIOC Consortium 2

Contents 3

Executive Summary 4

Core Message Takeaways: 4

The Healthcare System Poses a Complex HIT Problem for LTPAC Providers 4

Coordinating the Community of Care 5

Empowering the Clinical Interaction 5

LTPAC EHR Cannot be Technology or Feature “Lite” 5

An Extendible Platform 5

Call to Action for Software Providers 6

Core Vision - EHR Based Solutions LTPAC Providers Need Today 8

A. Introduction 8

B. Background 9

C. Context 10

D. Community 10

E. Site of Service 15

F. Functions 18

G. Usability & Extensibility 19

H. Compliance & Technology 22

Appendix 1.0 27

Clinical Care Delivery Processes 27

Executive Summary

Core Message Takeaways:

- EHR and EMR systems are critical enablers of the quality, process and innovation demands of the current healthcare spectrum. The ability for healthcare workers to deliver excellent patient outcomes and maximum quality of life for users of LTPAC settings depends greatly upon these systems.

- The LTPAC requirements for EHR/EMR are distinctive, robust, and full-featured. “EHR-lite” may work in the short-term but current systems will prove too limiting by 2016.

- The LTPAC EHR has unique focus and emphases around clinical process and holistic person-centered approaches involving an entire care team – physicians, nurses, therapists, pharmacists, dietitians, plus care and transition case managers. Often, many of these care team members do not work for a single healthcare organization, necessitating the concept of a “Virtual Care Team” to be embraced.

- LTPAC providers need the extensibility of an EHR platform in order to innovate and respond to their changing clinical and reimbursement context.

- The LTPAC EHR must be collaboration ready, supporting care-team, continuum of care, person-centered and person-directed realities.

- The LTPAC EHR must be future resilient, leveraging current technologies while looking forward to emerging technologies.

The Healthcare System Poses a Complex HIT Problem for LTPAC Providers

Comprehensively executed EHR based systems and technologies represent a key enabler for Long Term and Post-Acute Care (LTPAC) provider[2] success in navigating the rapidly shifting regulatory, payment, demographic, consumerist, care practice / delivery, staffing, quality, and business model scenarios facing healthcare markets today. Evolving incentives are reconfiguring healthcare delivery toward evidence, data, and technology enabled virtual care teams collaborating to deliver patient and population outcomes with transparency and accountability. The systems needed to accelerate this transformation must focus on connecting and empowering virtual teams within and across organizations, reducing friction between technology, caregivers, and patients engaged in clinical interactions; proactively supporting good decisions and care-giving; and delivering a platform for implementing and improving flexible patient-centered clinical practices. Such systems will be adept at incorporating emerging technologies, analytics, and protocols that accelerate their effectiveness.

---

[2] Settings considered by the authors for LTPAC include Independent Living, Assisted Living, Skilled Nursing, Long Term Care Hospitals, Memory Care, Inpatient Therapy, Outpatient Therapy, Home Care, and Hospice. Care delivery and related work processes were considered from each of these settings as a precursor to developing this visionary whitepaper.

Coordinating the Community of Care

Increasingly, patients achieve their health goals in concert with a community of caregivers, professionals, specialists, and providers who are coordinating within and across disciplines, care settings, organizations, and networks who, inclusive of the patient and family members, comprise a virtual care team. EHR based systems support these care teams by updating a comprehensive patient-centered health record, sharing relevant portions of that health records between members of the care team, and supporting clinical and process communications, transactions and outcomes between members.

Empowering the Clinical Interaction

LTPAC organizations need to incorporate context/service/setting-specific Electronic Medical Record systems and clinical tools within the broader context of a common integrated longitudinal person-centered electronic health record repository and platform supporting coordination across internal and external settings and services. A “one and done” philosophy is essential to eliminate redundant or even inconsistent information. Based on this common record, setting and encounter specific systems should optimize and enrich a frictionless real-time engagement between caregiver and patient that is proactively supportive of the appropriate care delivery process. When system and clinical processes are misaligned, quality, care, and documentation are disrupted with myriad unintended consequences undermining the effectiveness of care relationship. Emerging technologies are enhancing systems ability to remain non-intrusive while enhancing care outcomes and productivity with intelligent decision support.

LTPAC EHR Cannot be Technology or Feature “Lite”

LTPAC systems need to support rich sets of clinical functionality and interoperability while supporting best practices and regulations around information privacy, security, and availability. Caregivers need instant, mobile, in place access to patient record, care protocol, and decision support to ensure effective care and patient safety.

An Extendible Platform

The LTPAC EHR system must be versatile and extendible in the face of evolving care, coordination, and collaboration scenarios. Care protocols change based on evidence, condition, contract, and partnership. A platform approach can provide support for configurable workflows, rich data analytics and visualization, checklists and protocols, coordination, decision support, and social collaboration. When EHR platforms are delivered in an open way, system vendors, third party developers and peer providers can contribute to an eco-system of apps, intelligence, and tools that accelerate innovation. Mobile devices, sensors and robots (agents), big data, data analytics and visualization, social enablement (location, collaboration and messaging), and virtualization and clouds are key technology enablers for the non-intrusive integration of technology into every aspect of the care process.

Call to Action for Software Providers

As outlined in this EHR whitepaper, the challenges facing the LTPAC provider are daunting. Pressure is growing from every dimension: the clinical needs of the patient population are increasing; the regulatory requirements and obligations continue to expand;, there are higher expectations by both the patient and family members for greater access to information, on-line communication services, and IT amenities; there's downward pressure on reimbursements from almost every payer (federal, state, managed are and commercial); and a workforce that is challenged by the disjointed systems, on-line and paper processes they need to traverse in order to provide care across settings.

This EHR whitepaper proposes a vision for the delivery and use of an integrated, secure and optimized on-line system for the LTPAC care team, care delivery and interaction with the patient.

This on-line system does not exist today. If you walk around the industry you will see great variability to the use of clinical systems – many sites are still 100% on paper. Even the most advanced providers struggle to address their needs by hobbling together multiple independent/isolated systems, services and manual-paper processes to get the clinical and compliance work done.

We can and need to do better. But to make this happen we need your help.

1. Review this position paper and engage with your LTPAC customers around the vision it proposes.

2. Internalize the vision, and develop a strategy and operational plan to bring the scope of this system to the LTPAC community. Communicate your plan to your constituents so they understand your strategy and plan, and will help you achieve it.

3. Given the breadth of the LTPAC community and the scope of the system, it is unlikely that any single healthcare software company can develop and deliver such a system in the timeframe desperately needed by the industry.

   Identify your core competencies, and those that can be delivered by partnering with others. Forge relationships with others, with an eye towards full and seamless integration to accelerate time to market, while achieving the efficiency and workflow requirements outlined in the paper.

4. Work in concert with LTPAC providers to engage ONC in funding and services to effect the purchase, implementation, training, and support of these systems similar to what has already occurred for the hospital-acute and physician provider communities with HITECH.

   Having the system alone will not be enough to move the industry forward as many LTPAC providers lack the resources and talent to execute the system even if it was available.

The system needs are great, but so are the rewards. Unlike other parts of the health care industry, no one has a LTPAC system that can fulfill the needs outlined in this paper.bThe software supplier who gets there first, will certainly secure more of the market.

For those LTPAC providers trying to accomplish the system today by pulling together pieces and parts; dollars are already flowing to a wide range of vendors. As more integrated systems emerge, those existing dollar investments can be easily redirected.

Then there are those still on paper (or largely on paper) with a long way to go. These are new opportunities and dollars to be tapped.

The tsunami wave of aging people is coming and will drive demand and consumption of services across the entire LTPAC spectrum. They have more wealth, resources, and expectations than those that precede them.

Finally, you as software providers have a great responsibility. LTPAC providers who have implemented your systems have made enormous financial, operational and clinical commitment to your companies. It is hard to implement EMR/EHR systems and even harder to convert. However the ability for your LTPAC customer to meet their clinical, financial, operational, and customer service goals are increasingly reliant on the capabilities and operational resilience of your system and services.

Help your LTPAC customers achieve this vision. Help them deliver the quality care and clinical outcomes they are committed and obligated to provide, and their patients and customers expect.

Core Vision - EHR Based Solutions LTPAC Providers Need Today

A. Introduction

The role of long term and post-acute care (LTPAC[3]) within the healthcare delivery system continues to undergo dramatic transformation, while the challenges facing the LTPAC provider continue to mount. Rapidly changing regulatory and reimbursement environments, increased complexity and acuity of the patients[4] cared for in LTPAC, shrinking access to capital for Healthcare IT investment, and the expected integration with other providers both in LTPAC settings and across the continuum of care demand both more comprehensive and effective system solutions. Future viability of LTPAC organizations will depend on innovation and careful execution of clinical and business models that can respond to these changing dynamics. Systems and technology are at the heart of these new clinical and business models. The integration of effective and efficient clinical, business and operational processes are required for the current-day LTPAC provider to provide high quality care while meeting our regulatory and reimbursement obligations.

In addition to supporting changing LTPAC patient and caregiver needs, EHR and EMR[5] technologies have been identified as critical components required to support the sector's successful engagement in new payment methodologies and payer/provider networks that have evolved as a result of health reform. These pay for performance methodologies include reducing unnecessary re-admissions to the hospital, nursing home value-based purchasing (NHVBP) initiatives that provide financial incentives to providers who demonstrate high quality, and the creation of new partnerships among acute care, LTPAC, payers and government programs in the form of accountable care organizations (ACOs). As the adoption of these models spread, so will the financial pressures on LTPACs to provide high quality, cost-effective care that is electronically documentable, measurable and reportable. Significant investment in EMR capabilities will not only be necessary to capture, report and integrate quality and performance measures, but will enable the evolving business and clinical models this new environment will generate.

Technology enabled data and evidence-based strategies will be key to these efforts. The recently published ***2012-2014 LTPAC Health IT Roadmap*** identifies priority strategies around care coordination, quality, business imperative, consumer-centered, and workforce acceleration. It is important to note that these areas are all reinforcing and need to be seen within the context of multi-dimensional transformation that describes our industry today. This technical whitepaper will outline the key requirements and capabilities of a LTPAC system needed to support the LTPAC provider today, over the next 5-10 years, and into the future.

---

[3] This paper uses the phrase "LTPAC" to refer to the Long Term and Post-Acute Care sector of the healthcare provider community. This community includes a broad array of healthcare businesses providing patient care in a wide-range of settings. While not an exhaustive list this paper uses the phrase to encompass the following operations: Skilled Nursing, Long-Term Care, Assisted Living, Independent Living, Continuing Care Retirement Community (CCRC), Inpatient Therapy, Outpatient Therapy, Long Term Care Hospitals, Memory Care, Home Healthcare, Hospice and Adult Daycare.

[4] Based largely on the type of setting the individual is being treated or supported in, the provider community refers to the individual as a patient, resident, client, customer or consumer. For the purpose of this paper, we will refer to the individual as a patient, reflecting that in all cases the individual is in receipt of our healthcare services.

[5] Throughout this paper we refer both to the EHR and the EMR. We typically envision the EMR (Electronic Medical Record) to refer to the set of capability that supports an organization's delivery of care within a particular (often licensed) care setting or even a given care episode or admission. We use EHR (Electronic Health Record) to refer to an organization-wide system or set of systems that encompass all of the organizations care settings and include interfaces to external systems as well. The EHR system aggregates a comprehensive, longitudinal, person-centered record.

B. Background

The LTPAC spectrum is evolving rapidly. Housing, services and care are being coordinated in more and more ways for more and more complex customers. For example, until the last decade, LTPAC facilities were often nursing homes where frail and often cognitively impaired older adults resided for their remaining years. Today, in addition to providing custodial care, LTPAC facilities provide post-acute, short-stay rehab, skilled care, assisted living, hospice and home care services to medically complex patients. These patients are admitted directly from the hospital (in some instances directly from the emergency department) and many are discharged from the Skilled Nursing Facility (SNF) to their home within 30 days. This dramatic shift toward higher acuity care is being experienced across the LTPAC spectrum and is due to a number of factors including extensive changes in reimbursement and medical care, societal preferences, and implementation of the Patient Protection and Affordable Care Act (ACA).

The changing profile of the LTPAC population has led to a dramatic shift in the workforce that cares for these individuals. The care, once dominated by the certified nursing assistant (CNA) and licensed practical nurse (LPN), now can include a full team of professionals including registered nurses (RN), advanced registered nurse practitioners (ARNP), medical doctors (MD) and physical, occupational, speech and respiratory therapists (PT, OT, ST and RT) and others.

The historical impetus for development of EMR systems in LTPAC was based on supporting regulatory compliance and reimbursement for a predominately long term care population in one setting, such as a SNF, a Home Health Agency, or a Hospice. As these systems were developed, little attention was paid to supporting the clinical workflow process that guides professional clinical care within and across settings. The changing nature of both the care and workforce in LTPAC provides new challenges for EMR software providers.

C. Context

The LTPAC system will be presented from several vantage points:

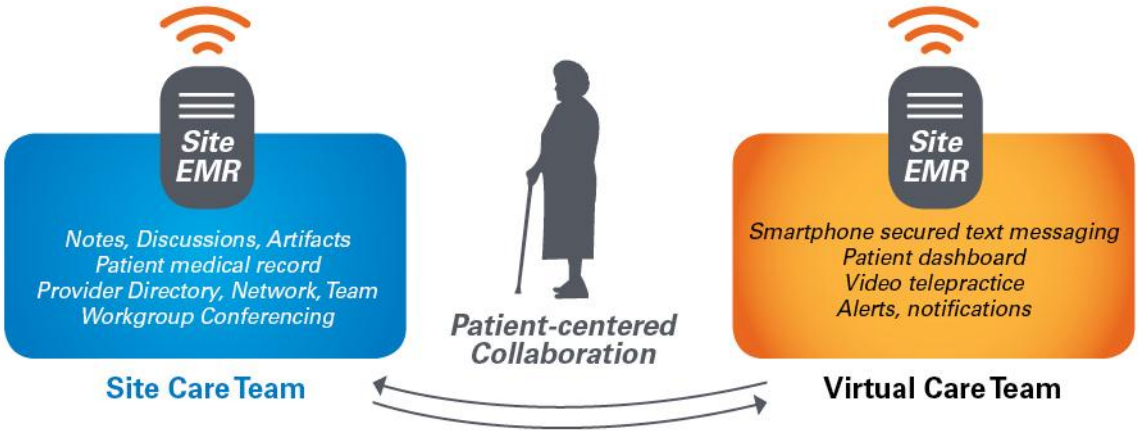
- Community
- Site of Service
- Core Features
- Usability and Extensibility
- Technical and Compliance

D. Community

The Virtual Care Team

While historically a lot of our attention has focused on the care and services provided within the four walls of the site of service, today's demands are requiring us to expand the definition of the "Care Team" to include all providers who interact with and provide services to the patient in our care setting – the on-site care team, admitting/attending physicians, consulting pharmacists, the institutional pharmacy, the lab or diagnostic service, the hospital discharge planner, the managed care case manager, the patient's primary care physician…

As this Care Team collaborates and provides care for the patient, they need systems that support their security needs, offer easy access to patient information (EHR) and provide effective tools for that collaboration; e.g. secured messaging, discussions, notes, computer conferencing and telemedicine.



Few LTPAC systems today accommodate this expanded view of the patient's care team and the need for team collaboration, even though this is a key component to efficient and effective delivery of quality care and successful transitions between care settings.

Note: *We know that this level of care team collaboration is vital to the delivery of improve patient care. Today's best example is the use of smartphone-cell phone texting between care team members. One survey indicated that over 96% of respondents felt that texting would improve patient care. The challenge with the current most widely available texting technology (SMS) is that is doesn't meet HIPAA's security and encryption requirements – and therefore the provider must choose between patient care and compliance. Which would you choose? We need a better solution that meets both patient and regulatory obligations.*

Beyond these core collaboration system services, integration with partner systems will be crucial as each of the partners will have their own systems for providing and managing their services (e.g. hospital, pharmacy, lab, homecare agency). The LTPAC system should be able to securely transmit and receive patient and care information to collaborating partner systems using a series of technologies both legacy (email, e-FAX) and modern (HIPAA and HITECH EDI protocols).

The Enterprise

Industry challenges are forcing many LTPAC providers to consolidate operations and provide a series of clinical, operational, financial, compliance, and technology services across several sites of service. These multisite providers require “enterprise” (multisite) systems and system services that:

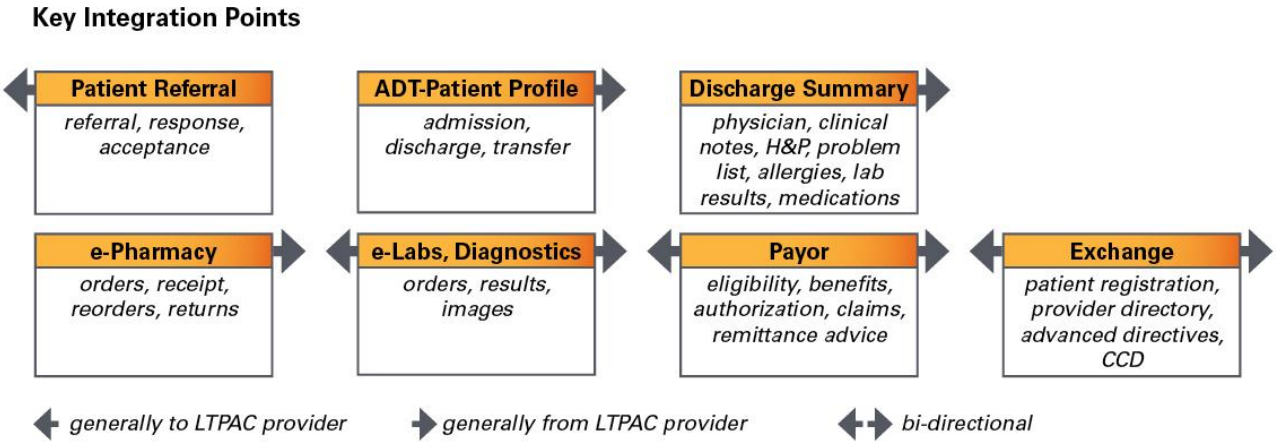
- Allow for efficient system configuration
- Consistently apply clinical and business protocols, documentation and practices
- Centralize back-office administrative functions which do not require direct patient, local presence (e.g. billing, collections)
- Integrate and automate payer transaction services (e.g. eligibility, claims, remittance advice, auto-cash posting)
- Monitor remotely
- Consolidate reporting and analytics
- Features comprehensive event capture, alert-notification and management, and
- Identify patient across setting and episodes of care.

Through the use of efficient, enterprise-aware and optimized systems and technologies, the LTPAC provider will be able to centralize non-patient care services and reduce overhead costs of these internal services, empowering the site of service, operators and clinicians to spend even more time and focus on the patient and patient care.

The Continuum

The vast majority of the patients we serve in the LTPAC setting enter from acute care, and the majority of them – particularly those in our short-stay centers – are discharged back to the home and their community healthcare network. In order to ensure an efficient and clinically safe transfer to and from the LTPAC setting, timely access to patient demographic/clinical information and an effective "hand-off" is vital.

THE LTPAC system needs to support a series of proprietary (e.g. Allscripts, Curaspan), standard (HITECH) and non-standard integrations with hospital and community-based systems and related health information exchanges (HIEs) to affect this electronic, secured transfer of information.



The challenge for the LTPAC provider's active participation in the continuum is having a LTPAC system which supports the vast array of critical clinical information needed to share with the continuum (see section ***F-****Functions* below), and moving to a real-time, point-of-care clinical documentation model so that the data is available for transmission when an event occurs (e.g. discharge to home or transfer to the hospital).

Both of the above pre-requisites require a substantial Healthcare IT investment on behalf of the LTPAC EHR software development companies, and its implementation by the LTPAC provider.

How much? *In February 2011 a CIO Consortium comprised of 35 of the largest LTPAC companies developed the "Electronic Medical Records (EMR) Cost Study" associated with implementing and operating EMR systems in the LTPAC environment. This study is available on the AHCA association website at the following address:*

http://www.ahcancal.org/facility_operations/hit/Documents/2011-02%20CIOC%20EMR%20Cost%20Study%20-%20Final%20Release(v3)%2006-2011.pdf

CMS recognizes the scope of the challenge and investment, and for Hospitals and Physicians have funded their implementation of comprehensive EHR systems through the Stimulus Bid and HITECH legislation.

The Customer

With the consumerization of healthcare, patients and their families are playing greater roles in the selection of healthcare benefits, selection of providers, and healthy lifestyle decisions/choices. HITECH regulation requires the LTPAC provider to supply the patient's EHR information upon request so they have direct access to their healthcare data and can "take it with them" for subsequent interactions with the broader healthcare community.

It is unclear, given the short period of time many of the LTPAC patients spend in some LTPAC settings, whether or not a LTPAC sponsored online Health Record would be of enough value to gain patient and family adoption. Those LTPAC settings that provide long-term supports and services – assisted living, home and community based services and PACE (program for all inclusive care) – may be excellent candidates for such system.

Regardless, there are aspects of secured and authorized information access that we believe do have across-the-board value. The first is compliance with the patient's right to their electronic medical records (noted above). The ability to provide portable electronic representation of the record and to integrate care summaries with broader based personal health records systems are relevant ways to comply with these requirements. The second is directed more at family members and/or responsible parties, providing authorized individuals with on-line access to information related to the patient's care; care providers and contact information, therapy and other appointments, dietary-food, social events, last clinical assessment, current list of medications, presented in a way that is both understandable and within context. The latter would allow the family member and/or responsible party to stay more connected to the patient and care they are receiving. This is particularly important if the party is geographically remote and unable to visit the patient on a regular basis.

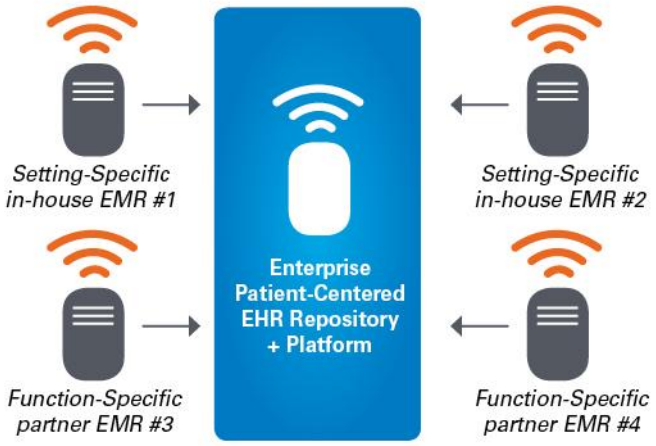
E. Site of Service

The EHR (Electronic Health Record)

Given the complex overlapping care communities in which LTPAC providers participate, organizations need to incorporate context/service/setting-specific Electronic Medical Record systems and clinical tools within the broader context of a common integrated longitudinal person-centered electronic health record repository and platform supporting coordination across internal and external settings and services. It is essential that our systems are built on the foundation of a single integrated EHR engine within which any real consumer/patient has a single identity against which structured, document, and social (interaction/conversation) information is recorded. **The system should promote a "one and done" approach where information recorded should obviate prior processes and downstream redundancies.**

When solutions deliver care-setting-specific clinical/work processes, they should reference from and contribute to this single integrated EHR. Care-setting-specific medical records may be managed as a "view" or "subset" or "extract" of the EHR, but should not be a competing system of record. When absolutely necessary – e.g., when the EHR system of record is not under the control of the provider or of the EMR system – then the system should implement rich integration API's that support dual-way exchange to the EHR.

Currently, most LTPAC providers address this requirement by assembling a variety of "best of breed" EMRs and build interfaces and repositories to integrate and/or aggregate data at the enterprise level. Some are implementing health information exchange technologies within their organizations to address this need. In any case, LTPAC oriented EHR/EMR systems will require high levels of conformance with the mature technical cores that have been defined by HL7 Functional Model, ONC (meaningful use) requirements, and CCHIT and other certification checklists.



As we describe in more detail below, our sector's requirements for security, auditing, authentication, encryption, interoperability, standards, support for vocabularies, document/transaction integrity, role-based access, availability and other EHR/EMR fundamentals are full featured and immediate.

Solution designers must focus on the overall efficiency and effectiveness of their design; factoring in the learning curve, use patterns, regulations, care and work processes that will become increasingly setting/context/provider independent and increasingly consumer specific. This concept of EHR based EMRs is an attempt to capture the flexibility that LTPAC provider solutions will need in the face of this shift.

As LTPAC software providers embrace and extend their systems to support the principles outlined in this paper, their systems will naturally evolve from a traditional EMR to a next generation EMR-EHR solution.

Traditional EMR
• Single care delivery model • Internal operations focused • Clinical, financial data repository • Limited or no patient access • Episode of care oriented • Isolated system, data
Next Generation EMR-EHR
• Multi-setting, modality support • Patient-person focused • Longitudinal health record • Care transition services • Care team collaboration • Patient access • Comprehensive care orientation • Interoperable system, date

The On-Site Clinical Care Teams

The clinical systems of the past decade are glorified documentation/form filling systems developed to achieve compliance with regulation and reimbursement. They require clinicians to maneuver through the system and input data that, in some cases, takes more time than the manual process it was developed to replace. These systems were not designed to support the clinical workflow process that guides professional clinical care. Clinicians recognize that they cannot rely on regulations as the primary guidance on how to care for sick, frail, chronically ill individuals. Instruments such as the Minimum Data Set (MDS) emphasize functional and psychosocial assessments and do not guide any one discipline in the adequate assessment of physical problems or medical conditions, or how to identify the specific problems and select the right interventions. Clinicians rely on clinical care delivery processes (workflow) to provide care (reference Appendix 2.0).

The care delivery process embedded in clinical workflow is often characterized in terms of a pattern of actions that clinicians utilize to perform routine task and generate results. Thus, clinical care (nursing, medical, therapy and others) is delivered to patients and residents in a stepwise, systematic process that is called the care delivery process. The steps of the care process must occur sequentially if it is to be effective. Use of a systematic care-delivery process is important because it reduces guess work and helps increase the likelihood that correct, safe care will be given, contributing to improved care quality, customer satisfaction, regulatory compliance, financial performance and reduced legal liability.

Clinicians strive to “fit” their care delivery process or workflow into the EMR modules. For example, there are assessment components (beyond the MDS) in a number of different modules. This lack of alignment between clinical care delivery and the existing EMR modular configuration causes disruption in workflow and results in development of “workarounds”, thus negatively impacting productivity and causing a myriad of unintended consequences. Rather than achieving the promised efficiencies, returns on investment and improvements in quality and safety, the current state of EMR in LTPAC is often disruptive to clinician’s daily work.

We have engaged more users in electronic documentation, but the information flows for most workers have been mostly one way, after the fact, distracting burdens interrupting caregivers from their core processes. The systems we deploy now must fully engage every member of the care team, internal and external, including the patient themselves and their families and informal caregivers (across all care communities described above).

These solutions must inform, enable and document every stage of the care process. The technology will increasingly become a non-intrusive but ubiquitous part of every care encounter. The ability to fully integrate decision support, clinical protocol and checklists (Atul Guwande) become essential to achieve quality consumer interactions, experiences and outcomes.

Professional caregivers need to be up-to-date on most current knowledge and practices. Given the explosion of information as the industry adopts evidenced-based clinical practice guidelines, there is simply too much for one person to know. Therefore, EMRs need to incorporate clinical-decision support intelligence that assists with treatment options, identifies precautions, and alerts providers of deviations in practice. We've made some impressive gains in automating core healthcare transactions; however, much work remains to address both process and knowledge issues and indicates a need to surround transactions with intelligence.

F. Functions

Many of the functions required within the LTPAC EHR system align well with the standards established in the HL7 EHR-S and the CCHIT certification process. While the high-level list below should cover most of the LTPAC care settings, there will be variability in function specifics, process, protocol and workflow.

Community Integration	Financial
• eDischarge integration (up + downstream) • Pre-admission • Intake assessment, triage, placement • Admission, quick-admit • Directives, consents, authorizations • Discharge evaluation, readiness, transition	• Census • Episodes, services, encounters, coding • Eligibility, authorization, re-authorization • Ancillary charge import • Billing, statements • AR, denials management, collections • Cash receipt, posting • Transaction clearinghouse integration
Care Delivery	**Communication**
• Patient profile, snapshot, dashboard • Patient verification (including 5Rs) • History, vitals, ht-wt, allergies, immunizations • Assessments + evaluations, MDS • Care plans, guidelines and protocols • ADL • Progress notes and reports • Physician H&P, NP, CPOE, authorization • Decision support • Food & nutrition, dietary • Medication administration, Rx-integration • Therapy (PT, OT, ST, RT) • Activities • Radiology, order, results-integration • Lab, order, results-integration • Biomedical device data capture • Paper & non-native document capture • Patient-centered scheduling	• Care Team communication, secured texting • Tele-practice • Collaboration **Customer** • Patient and responsible party communication • Medical record access, distribution • EHR on-line access • Patient progress reporting **Management** • Alerts; operational + clinical • Event management • Workflow • Remote monitoring by internal audit • CMS audit access
Analytics	**System Foundation**
• Quality measurement & outcomes • Customer reporting & analytics • Capitation and risk management	• Single integrated EMR repository • Security, privacy, audit • User identity management, single sign-on • Libraries, classifications, directories • HIE, hospital and provider exchange • Web-Internet accessible, mobility • Backup, recovery, operations management • Back-office integration; HR, GL

G. Usability & Extensibility

The Patient

The caregiver needs to focus their efforts and energies on the patient. At the same time, they can provide better care if they can quickly and efficiently access the patient's care profile, digest broad and specific information relevant to the patient's general condition and their specific clinical needs, and take knowledgeable action. To accomplish this goal of "knowledgeable action", the caregiver needs instant access to the EMR via a handheld or other mobile device, rapid and secured access to the patient's medical record, and a clinically, role-based, single-page profile of the patient's condition and status. As our EMRs become more capable and store more information, the ability to present this fast and easy way to engage around a patient's on-line profile becomes even more vital.

Protocol-Driven and Contract-Based Workflow

The system workflow process should be driven from a defined and customizable set of clinical protocols based upon evidenced based care. Then, based upon the patient's clinical profile, the system will suggest or require specific care plan activities, treatment protocols, work steps, reminders, alerts, etc.

These protocols can also be associated with an insurer, payer, managed care, ACO or other shared-risk partner, and collectively associated with 3rd parties and a patient population, so that care protocols and care delivery can be system-facilitated in line with contractual or regulatory requirements.

Patient Safety

Systems can play a large role in improving the safety of our patients – from proper patient identification, assuring the right medication is delivered to the right patient at the right time, perimeter alarms, vital sign and medical device equipment alerts, exceptions to clinical protocols, abnormal lab result triggers, and so on. Patient safety should be a key design goal in each aspect of the system that relates to direct patient care.

User Experience

Non-intrusive engagement will require dramatically improved user experience. Systems will have to support delivery of just the right information at just the right time, easily viewed and interpreted with decision support informing correct action and alerting to anomalies and errors.

Users should never be asked to provide information that the core EHR, previous work efforts, device monitors, or inference engines can provide. A "one and done" philosophy should be applied to the system design; an elimination of all non-value added duplicate and redundant work.

Required system interactions will need to support least effort and least distraction strategies for real-time documentation. Functions will need to be highly intuitive with easily accessible just in time support, training and reinforcement available.

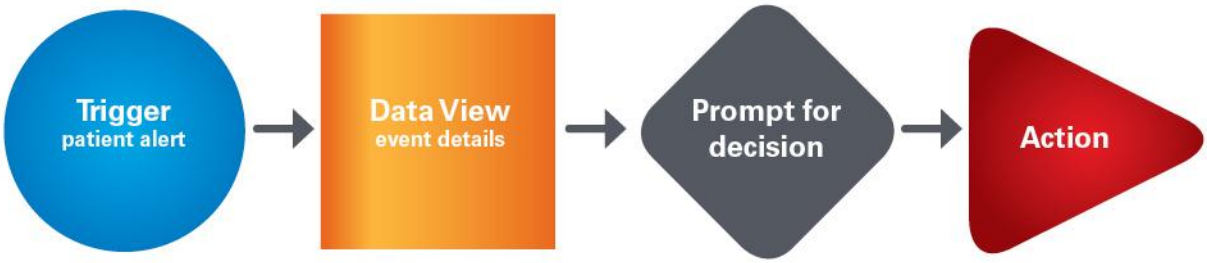
Emerging technology tools are providing rich resource for enabling this new vision of the non-intrusive integration of technology into every aspect of the care process. Mobility, communication, social enablement, location management, sensors, data analytics, visualization and decision support technologies will all inform this process.

Extensible

This ease/transparency of use needs to extend to implementation and design. Even basic, core, well-understood care processes and patient interactions will need to be supported by flexible technical work processes that can be easily configured based on changing evidence, improving practice, and professional preference. Our evolving business/clinical environment requires rapid innovation in design of care workflows and processes within and across changing care settings. Our systems need to support iterative cycles of assessment, planning, implementation and evaluation -- technology innovation that follows the nursing process. This extensibility is not a peripheral issue. It requires a platform approach that ensures that all system workflows can be consistently developed, implemented, managed, and improved.

The same extensibility platform, our workflow platform, if you will, informs multiple dimensions of extension. A report, a custom care process, an internal systems interface, a mobility extension, a device/robot integration, an interoperable document exchange, or a cross-entity coordination all reflect the same basic workflow platform requirements. A core patient-centered EHR and secure role-based (by people, device or algorithm) access control are prerequisites.

Every unit process includes a trigger, a particular data view, a recommended action (prompt, alert, decision support, etc.), an execution-communication-documentation of action including any new data associated with that action, and an update of relevant data. Depending on the participants in this process various strategies for alerting, visualization, and capturing of action/decision may be pertinent. The effective workflow platform will provide rich support for developing unit processes and assembling multiple unit processes into complex process.



Data Visualizations

The workflow unit process described above can be oversimplified as trigger-> information -> action -> information. Finding rich new ways of visualizing information is a key factor in assuring that workflow processes can be defined in ways that are highly intuitive and compel user engagement and effectiveness.

Checklists & Protocols

Increasingly in the healthcare world checklists are being seen as a strategy for defining and securing compliance for complex, high impact processes. The workflow platform should be able to richly leverage the checklist pattern both for development and for implicit user experience. Clinical protocols are a formal example of checklists.

Coordination

While workflows guide task- and process-level actions and checklists organize complex activities, dashboards provide top-down views, allowing actors and decision makers to manage sets of work. A dashboard may present as a list of lists, as a calendar, an inbox or a variety of different metaphors. Systems should provide a variety of tools to help a worker gain and maintain focus. Context awareness (particularly location awareness) can be a significant tool for simplifying interaction and enhancing focus. Cumulatively, the strategies described turn the idea of a user interface upside down. Rather than a system presenting an interface of all possible actions/information from which the user selects focus, the system leverages location, identity and time to present a narrow set (preferably one) of relevant actions and then “collaborates” with the user via richly visualized interfaces to assure appropriate action.

Decision Support

The “prompt” aspect of the unit workflow process brings evidence to bear on system outcomes. For example, today most clinical systems leverage medication databases to reduce medication errors. The best ability to generate and integrate static and dynamic expertise based on both internal and external sources (big data) and apply that expertise to the workflow “prompt” step in order to enhance workflow outcomes will be a key differentiator of effective EHR systems. These systems will not only provide tools to analyze but will source and pre-analyze the “big data” needed to “prompt” workflows.

Outcomes and Pay-for-Performance

The same tools and techniques referenced above must also be used to capture clinical outcome measures, to report and provide feedback on performance so that process improvements can be made quickly, identified gaps in process execution closed expeditiously, and most likely, ultimately be used in pay-for-performance payer arrangements.

Social Collaboration

Historically, workflow systems viewed roles statically, with processes flowing in structured order from one participant to the next. In our post-Facebook world, the benefits of socialization of work and workflow are becoming better understood. The ability to “share”, “like”, “follow”, “group chat” people, tasks, events, objects, records, and documents can significantly enhance any work team’s cohesiveness, effectiveness and productivity. While there are particular security concerns that need to be accommodated, care teams are no exception. Socialization adds an accelerator dimension to all aspects of the workflow platform described above.

Accelerating the Rate of Innovation

An effective workflow platform should be able to accommodate development and sharing of capability by vendors, third parties, the individual provider, and the community of providers. In fact, the value enabled by the workflow platform is primarily found in the network effects of the artifacts developed, rather than the platform itself.

An example of this is Salesforce.com. Salesforce.com delivers a comprehensive core CRM. It also delivers a CRM aware platform with database, workflow, interface, portal, social, and mobility building blocks that allows development and extension of rich application capability. These building blocks can be invoked to extend the

system capabilities at field, object, table, screen, event, flow, report, integration, system and device levels. The platform is upgraded several times each year with minimum impact on the artifacts delivered on the platform, ensuring persistence and resilience of “extension”. An active developer community has developed thousands of tools, apps and extensions resulting in an evolving CRM app ecosystem. Customers further configure the CRM platform to their particular processes and environment.

Without such a platform enabled ecosystem of development and extension, systems can become major barriers to innovation.

Key Usability Opportunities

- Leveraging mobile devices to provide real-time participation in care processes leveraging configurable workflows and checklists.
- Leveraging the new direct HISP protocol to build secure cross provider workflows and passing information through standards based document attachments.
- Supporting the integration of hardware and software based monitors and agents (robots and algorithms) into care delivery processes.

H. Compliance & Technology

Compliance

The LTPAC provider is highly regulated and must comply with a wide-range of controls stipulated in federal and state laws. The most significant IT controls are part of the HIPAA Transaction, Security and Privacy, ARRA and HITECH legislation.

We won’t try to incorporate all of the elements of the legislation here, but want to highlight several elements critical to a viable EMR solution:

1. All electronic patient health information (EPHI) must be protected and secured. This not only entails the EMR application and “production” data base, but all extracts, interfaces and transaction feeds. The EMR should either enforce the protection of extracted information, or include the workflow necessary to make it easy for the user to add the security as appropriate.
2. System and patient data access must be specifically authorized and controlled on a “required to perform one’s job responsibilities” basis. The EMR should support electronic feeds from LTPAC HR systems and other sources to automatically enable or disable access based upon a change in job status (e.g. termination) or job role.
3. Individuals accessing the system and patient data must have their own identifiable account. Use of the system must be tracked and auditable within the EMR. The EMR should support user identity management and single sign-on.
4. The EMR should provide the ability to monitor EMR use and for disabling system access when such use is no longer appropriate or authorized; this is critical not only for the LTPAC provider’s internal

employees and staff, but for the virtual care team members as well (reference **section D** above). Ideally, the EMR would support a system credentialing, re-credentialing process based upon rules established by the LTPAC provider.

5. LTPAC providers must provide user identifiable, secured access to authorized regulators, surveyors and auditors on demand. The EMR should provide for rapid provisioning and de-provisioning of these constituents.

6. If an authorized user is logged into the system; after a period of system inactivity, the display should be locked (requiring authorization to unlock).

7. All workstations and mobile devices should be encrypted. All EMR functions with local EPHI data must provide additional access security controls on the device. Locally stored EMR EPHI should be encrypted in addition to the device encryption.

8. The EMR should provide the ability to easily extract a patients profile and related records and provide them in a secured, readable format upon request to the patient or authorized related party. Such request and the satisfaction thereof should be tracked in the EMR.

9. When participating in the exchange of information with other authorized parties in the healthcare continuum, the EMR should support industry standard and endorsed HL7 transaction sets, the Continuity of Care Document (CCD), and the new eINTERACT protocols.

10. The EMR should provide a secure communication and messaging environment for the care team supporting the full array of end-point devices in use by the care team: workstations, mobile devices and smart phones. This is key to providing the real-time communication services needed to provide higher-quality care, executed using a secured, encrypted platform (vs. unsecured SMS text messages).

11. Unfortunately, litigation and the associated preservation and discovery processes therein are a routine part of LTPAC realities. The EMR needs to provide an efficient and secure way to extract patient information in whole or part in readable format in support of these discoveries. If data is to be archived within the EMR, the archive needs to be searchable and retrievable as well.

Technology

Once fully implemented, the EMR becomes part of the “lifeblood” of the LTPAC organization. As such, it must be resilient, reliable, secure, scalable and high performance. It must also keep pace with the ever-changing dynamics in the technology and healthcare fields; as the LTPAC organization’s ability to implement new and evolving technologies will be “gated” by the ability of its EMR system and vendor-partner to support them.

While not meant to be an exhaustive list, the following are key technology attributes vital to a successful EMR solution:

1. The EMR solution needs to be available. For LTPAC and Software as a Service (SaaS) providers, this means providing commercial grade scalability, redundancy, load balancing and monitoring to ensure a high grade of service-responsiveness and protection from routine, single component failures. Time-critical functions such as Medication Administration require local care-setting support to protect these vital patient care services from local network outages which might “disconnect” the center and staff from the SaaS or hosted EMR system.

2. The EMR hosted environment requires a comprehensive, validated and routinely tested data backup, disaster recovery (DR) and business continuity plan. All data backup and DR data containing EPHI must be encrypted. The DR plan should include not only system and data restoration, but network connectivity validation to all EMR customers. Directionally, the DR plan should move to a more real-time recovery approach allowing the restoration of services in a short-period of time (minutes); minimizing downtime, data loss and impact to their EMR customers.

3. The LTPAC and SaaS EMR provider should conduct internal and 3rd party annual audits to evaluate and attest compliance with regulatory requirements, general IT and security controls, and penetration testing. Such providers should implement commercially reasonable security controls to prevent viruses/Trojans/worms, malware, denial of service, malicious intruders and other cyber security attacks.

   SaaS EMR providers should complete, and provide upon request from their LTPAC customers, reports certifying their IT controls including: SAS 70, SSAE-16, and SOC 2 as appropriate.

4. In circa 2013 terms, the EMR should be an Internet, Intranet accessible web-application, providing authorized care team members with access irrespective of location.

   The access should support the range of commercially viable Internet browsers (e.g. Microsoft Internet Explorer, Google Chrome, Mozilla Firefox, and Apple Safari), and mobile devices (e.g. Apple iOS, Google Android, and Microsoft).

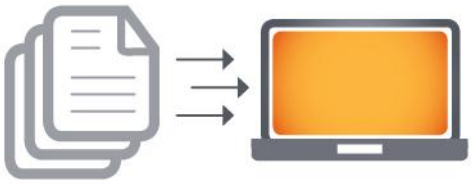
   Movement to supporting the WWW Consortium HTML5 standard is encouraged.

5. Since the majority of the LTPAC workers are mobile, the EMR should support mobile devices as a key capability of their system. The mobile device support should include multiple form factors including mobile phones and tablets, and the EMR should be optimized to that form factor.

Given the state of wireless technology in 2013, the EMR mobile applications should support both an on-line/connected and an off-line/disconnected state. The EMR should support a streamlined process for caching relevant patient data on the device, allowing the clinician to work off-line, and then re-syncing any updated information back to the EMR once in network range or on-demand.

6. Over the last decade, a lot of attention has been focused on getting information into the EMR, but less so on getting information out. Sections above address the workflow and interactive decision support capabilities needed in the EMR system; in addition, the LTPAC provider needs comprehensive operational reporting, outcomes and analytics support. Not only should this be provided by the EMR provider, but it should be extensible; e.g. the EMR customer should be able to use the EMR vendor's Business Intelligence (BI)/Reporting platform to develop, integrate and deploy their own customer-specific reports and analytics aligned with the priorities, needs and nomenclature of their organization and their customers.

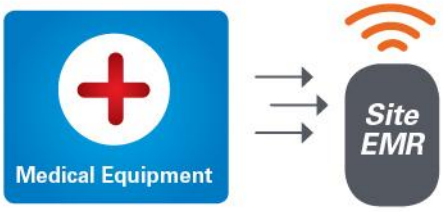
7. The transition from a paper medical record to an electronic medical record (EMR) is a challenging one. What is even more challenging is being stuck in between, a place most of the LTPAC companies find themselves; partially on-line and with the balance on paper.



This separation of the medical record causes a great many inefficiencies and the risk of compromised care associated with not viewing all aspects of the patient's care in one place.

For this reason, EMR providers should move quickly to incorporate all key elements of the EMR into their system.

System interfaces should be developed between key sub-EMR systems dominant in the LTPAC community; for example, the contracted Rehab-Therapy, Pharmacy, Diagnostics and Laboratory testing providers in the Skilled Nursing segment.



For any of those key data elements not supported directly or through an interface by the system, the EMR should provide a viable and efficient means for the LTPAC provider to scan, receive, catalog, and post the information into the EMR.

8. While medical device integration has been a staple in acute care systems, it is still new in the LTPAC EMR space. The advent of smarter and lower-cost mobile technology is increasing the number of medical device solutions for LTPAC. There is life-critical information on these devices and the more they are integrated into the EMR the more clinician efficiency can be increased, data quality in the EMR improved, and ultimately higher quality clinical care delivered.

Key Technology Enablers

- Mobile devices
- Sensors and robots (agents)
- Big data, data analytics and visualization
- Rich extensible workflow, integration and coordination
- Social enablement (location, collaboration and messaging)
- Virtualization, clouds (public and private) and services (Infrastructure as a services (IAAS), Platform as a service (PAAS) and Software as a service (SAAS).

Appendix 1.0

Clinical Care Delivery Processes

Step A1: *Assessment*

1. Obtain and review information including:
   - Personal and medical history including physical, functional, psychosocial information
   - Past medical history and physical, diagnostic tests, laboratory results, practitioner orders, medications
2. Observe patient/resident.
3. Conduct physical assessment including review of systems, functional, cognitive and other specialty assessments.

Step A2: Problem Identification/Diagnosis – *What is the problem?*

1. Use clinical judgment to interpret and analyze data.
2. Identify how existing symptoms, signs, diagnoses, test results, dysfunctions, impairments, disabilities, and other findings relate to one another.
3. Identify the need for additional analysis and intervention
4. Define significant risk factors.

Taken together, these first two steps enable the clinician to develop pertinent, individualized care plans and interventions.

Step B: Care planning – *How to manage the identified problems*

1. Define overall goals and objectives for services and care with the individual.
2. Set priorities.
3. Identify risks and benefits of treatment options.
4. Select appropriate interventions.
5. Clarify prognosis.
6. Write plan of care.

Step C: Intervention and Monitoring *– Putting the plan into action*

1. Utilize the care plan to coordinate and provide care for the individual.
2. Identify and implement interventions and treatments to address the individual's physical, functional and psychosocial needs, concerns, problems and risks.
3. Administer treatments and services.
4. Monitor condition and response to treatment and interventions.
5. Manage complex situations and complications.

Step D: Evaluation *– Did the plan work?*

1. Evaluate the effectiveness of the interventions and the appropriateness of the care plan.
2. Identify course of condition, success of interventions and progress toward goals.
3. Identify factors that are affecting progress towards achieving goals.
4. Adjust treatments and interventions based upon individual’s response.
5. Continue to implement and evaluate care plan.
6. Reassess and identify when care objectives have been achieved sufficiently to allow for discharge, transfer, or change in level of care

cioconsortium

NURSE EXECUTIVE COUNCIL